Viewing the Spill From Above

NOAA Pilot Eyes the Gulf Coast

NOAA's Lt. Cmdr. Kristie Twining has seen her share of important missions. From high above in her Twin Otter airplane, she and teams of NOAA scientists have tracked the migration of northern right whales, surveyed marine sanctuaries and collected air quality data from the atmosphere.

NOAA Corps pilot Lt. Cmdr. Kristie Twining in the cockpit of a NOAA Twin Otter aircraft.

High resolution (Credit: NOAA)

Twining, a **NOAA Corps** pilot based at **NOAA's Aircraft Operations Center**, recently took to the skies to carry out a much different mission: overflights of the scene of the Deepwater Horizon/BP oil spill in the Gulf of Mexico.

What is the purpose of the overflights you've been piloting?

Our flight crew has been taking ocean imaging experts out over the spill area to collect critical oil density and thickness data.

We capture this information in-flight using very sophisticated instruments — a multi-spectral scanner and an Earth-observing sensor — mounted in the belly port of our Twin Otter plane. The data are processed through a laptop computer using a software system capable of differentiating between thick oil and sheen. (Satellite images can depict sheen boundaries, but typically cannot locate the patches of thick oil.) Imaging scientists analyze the data in more detail once we're back on the ground.

Our flights are also providing critical imagery for those who are tracking the spill's movement and direction. We use radar data from other aircraft as a reference and then fly tracks across different areas to map and image the spreading oil. It's really neat to be involved in helping to collect data that are actually being used every day.

What does a typical day looks like?

It's a long but productive day. I wake up before the sun comes up and check for any active air space or flight restrictions in the area of the spill site. Before our crew leaves our hotel in downtown Mobile, Ala., to meet our plane at the Mobile Airport, we obtain weather and military activity briefings and file a flight plan.

A typical overflight lasts about three to four hours. It takes about 45 minutes to get out to the spill site, and about 30 minutes to get back — its only 100 miles from the airport, but the Twin Otter has a lot of drag. It was meant to fly slow and land on short runways, beaches and frozen tundra — it is not a high-speed, high-performance plane.

NOAA Corps pilot Lt. Cmdr Kristie Twining (left) and Capt. Michele Finn stand alongside a NOAA Twin Otter airplane used to conduct overflights in the Gulf of Mexico.

High resolution (Credit: NOAA)

What's the best time of day to fly to collect this type of data?

Lately, we've been flying twice a day when the sun angles are less direct, in early morning and the late afternoon. This gives us better-quality camera images. If there's a lot of glint, or reflection from the sun shining on the water, the image quality can be poor. In between flights, scientists are busy processing and interpreting all the data.

Have you been struck by what you've seen from the air over the spill-affected areas of the Gulf Coast?

I've never flown over an oil spill of any significance, until now. It's certainly massive in size and the response effort. From the air, we can see how much oil is coming up from the source and the extent of the spreading. We can also see the before and after effect of deepwater and surface dispersants as they are being applied.

It's amazing to see from above the teamwork underway to contain the spill. Every day we go up, we see aircraft flying below us — some of them are dropping dispersants over oiled areas, some are out there

spotting for thicker oil, some are surveying for impacted marine life, and some are carrying authorities monitoring the spill's effects.

What makes the Twin Otter aircraft well-suited for this mission?

Well, it has a number of advantages. It has an unpressurized cabin that allows for an open port in the belly capable of accommodating many kinds of instrumentation. In this set-up, cameras have clear views of the oil, and the mounted sensors can better detect atmospheric conditions below. This would not be possible on a pressurized aircraft without having a special camera glass cover mounted over the belly.

The Twin Otter can also carry a significant amount of weight from people, instruments and fuel. We can also fly slower, lower and longer than most other aircraft — up to seven hours at a time.

What considerations do you take into account when flying over an incident site like an oil spill?

We're mostly concerned with cloud cover. We can get high-definition imagery in any kind of weather, as long as the skies are clear below us. To get overlapping images, we also must fly higher than our normal 12,500 feet.

What type of training have you had to prepare you for this kind of work?

I've been flying **NOAA planes** — the Twin Otter and the Gulf Stream IV — for eight years. Right now, I'm an instructor pilot on the Twin Otter and am one of the senior aircraft commanders.
I also have extensive experience flying all over the Gulf of Mexico. The challenge there is with airspace coordination. There are many military agencies flying training and simulation missions in this region. However, I'm very comfortable operating in such a busy airspace.

What other types of missions do NOAA's Twin Otter aircraft support?

NOAA operates four Twin Otters. Typically, we conduct a number of marine mammal surveys. For instance, we fly over Alaska to help scientists study harbor seals and sea lions. Once or twice a year, we conduct flights in conjunction with NOAA's Earth System Research Laboratory in Boulder, Colo., on behalf of **air chemistry field studies**.

What has been the most satisfying part of your role in NOAA's response to the BP oil spill?

I really enjoy being helpful and working towards a greater cause. We're operationally oriented, and we're always ready to fly at a moment's notice.

*Lt. Cmdr. Twining is based out of **NOAA's Aircraft Operations Center** at MacDill Air Force Base in Florida. Her next assignment is flying NOAA's Twin Otter in California across the Los Angeles-Sacramento region as part of **a major air chemistry study**.*

About NOAA's Office of Marine and Aviation Operations and the NOAA Corps

NOAA's **Office of Marine and Aviation Operations** operates a wide variety of specialized aircraft and ships to complete NOAA's environmental and scientific missions. NOAA's aircraft and ship fleet is operated and managed by officers from the NOAA Corps along with wage mariners and civilian technicians and other employees.

The **NOAA Commissioned Officer Corps** is one of the seven uniformed services of the United States. The NOAA Corps is composed of professionals trained in engineering, earth sciences, oceanography, meteorology, fisheries science and other related disciplines. Officers operate **ships**, fly **aircraft**, manage research projects, conduct **diving operations** and serve in staff positions throughout NOAA.